

## Advancements in the lithostratigraphy, palynology and boundary relationship of the Upper Carboniferous Cumberland and Pictou groups in southeastern New Brunswick

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In southeastern New Brunswick, the Upper Carboniferous Cumberland Group and overlying Pictou Group comprise repetitive fining-upwards sequences of fluvial and minor paludal strata. Prior to this study the Cumberland Group north of the Hastings Uplift was undivided and entirely assigned to the Boss Point Formation. New palynological assemblages and refined spore zonations have allowed subdivision of the Cumberland Group into the basal Boss Point and overlying Grande Anse formations. The Grande Anse Formation was previously known only on the Hastings Uplift. South of the Uplift in the Cumberland Subbasin of Nova Scotia the Boss Point Formation is overlain by the Joggins Formation.

The Boss Point Formation in New Brunswick is now restricted to the lowermost fining-upwards megasequence of the Cumberland Group. It comprises grey quartz-pebble conglomerates, grey to olive green quartzose arenites and grey to locally red-brown mudstones. Several new spore collections include key species such as *Kraeuselisporites echinatus*, *Ahrensia sporites beeleyensis* and *Spelaotriletes arenaceus* but lack the smaller species of *Florinites* and indicate a Namurian B (Kinderscoutian) to early Namurian C (Yeadonian) age for the Boss Point Formation. The overlying Grande Anse Formation is dominated by multistory buff to light pinkish-grey, feldspathic, quartzose arenite, quartz arenite, and pebbly quartzose sandstones with lesser overbank grey or red-brown mudstones and thin coal seams. Palynological assemblages in

the Grande Anse comprise key species such as *Florinites mediapudens*, *F. junior*, *Cannanoropollis mehtae*, *Wilsonites* spp., and striate bisaccates and indicate an age no older than mid-Namurian C (Yeadonian) to probably early Westphalian B (Duckmantian).

The Salisbury Formation, the basal unit of the Pictou Group, comprises a regionally distributed 'red facies' and a locally developed basal 'grey facies'. The grey facies consists of grey to pinkish grey feldspathic quartzose arenites, pebbly sandstones and minor red (rarely grey) mudstones. The grey facies was previously included in the undivided Boss Point Formation. The red facies is dominated by red mudstone and fine-grained sandstone with lesser red to grey coarse feldspathic and lithic sandstones and quartz arenite. Rare grey mudstone beds in both the grey and red facies yield late Westphalian B – Westphalian C (late Duckmantian – Bolsovian) spore assemblages. The chronologically significant spores in the Salisbury include *Vestispora magna*, *V. pseudoreticulata*, *V. foveata*, *Illinites unicus* and *Protohaploxylinus* spp.

The Salisbury Formation (basal Pictou Group) disconformably overlies the Grande Anse Formation (upper Cumberland Group). Contrasting spore assemblages and spore ranges in the two formations indicate the disconformity is probably a middle Westphalian B (Duckmantian) event.